

CLAIMS

What is claimed is:

- Sub 7  
B1
1. A nucleic acid mimic comprising a non-naturally occurring backbone structure to which are appended a plurality of heterocyclic bases,

at least one of said bases being substituted with at least one sterically bulky substituent at a position one, two or three atoms removed from the position of attachment of said base to the backbone.

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2. The nucleic acid mimic according to claim 1 wherein said sterically bulky substituent is  $-R'$ ,  $-OR'$ ,  $-SR'$ ,  $-N(R')_2$ ,  $-C(R')_3$ ,  $-C(=X)(R')$ ,  $-C(=X)(-Y-R')$  or  $S(=O)_2(-Y-R')$  wherein:

X is O, S or NH;

- 15 Y is O, S or NH; and

wherein  $R'$  comprises at least 3 atoms and is H,  $C_1-C_{50}$ -alkyl,  $C_2-C_{50}$ -alkenyl,  $C_2-C_{50}$ -alkynyl,  $C_7-C_{50}$ -alkyl-aryl,  $C_6-C_{50}$ -aryl,  $C_{10}-C_{50}$ -naphthyl,  $C_{12}-C_{50}$ -biphenyl,  $C_7-C_{50}$ -aryl-alkyl, pyridyl, imidazolyl, pyrimidinyl, pyridazinyl, quinolyl, acridinyl, 20 pyrrolyl, furanyl, thienyl, isoxazolyl, oxazolyl, thiazolyl and biotinyl, wherein  $R'$  can be substituted one or more times by  $-NO$ ,  $-NO_2$ ,  $-SO_3^-$ ,  $-CN$ ,  $-OH$ ,  $-NH_2$ ,  $-SH$ ,  $-PO_3^{2-}$ ,  $-COOH$ ,  $-F$ ,  $-Cl$ ,  $-Br$  and  $-I$ .

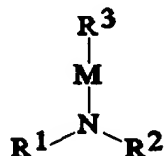
3. The nucleic acid mimic according to claim 1 wherein said base is a naturally or non-naturally occurring pyrimidine base.

4. The nucleic acid mimic according to claim 3 wherein said sterically bulky substituent is bound to C-6, C-5 or N-4 of said naturally occurring pyrimidine base.

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5. The nucleic acid mimic according to claim 4 wherein said sterically bulky substituent is bound to N-4 of said naturally occurring pyrimidine base.
6. The nucleic acid mimic according to claim 5 wherein  
5 said naturally occurring pyrimidine base is cytosine.
7. The nucleic acid mimic according to claim 5 wherein said sterically bulky substituent is (C=O)-R'' wherein R'' is C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>6</sub>-C<sub>18</sub>-aryl.
8. The nucleic acid mimic according to claim 7 wherein  
10 said sterically bulky substituent is (C=O)-C<sub>6</sub>H<sub>5</sub>.
9. A method for the determination of a nucleic acid comprising:  
    providing a nucleic acid mimic;  
    incubating said nucleic acid mimic and said nucleic  
15 acid under conditions suitable for the formation of a duplex between said nucleic acid mimic and said nucleic acid; and  
    determining the occurrence of said duplex as a measure of the occurrence of said nucleic acid;  
    said nucleic acid mimic comprising a non-naturally  
20 occurring backbone structure to which are appended a plurality of heterocyclic bases,  
    at least one of said bases being substituted with at least one sterically bulky substituent at a position one, two or three atoms removed from the position of attachment of said  
25 base to the backbone.

10. A compound for the preparation of a nucleic acid mimic having the general formula:



wherein:

R<sup>1</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl having at least one -COOP<sup>1</sup>, -NHP<sup>1</sup>, -OP<sup>1</sup> or -SP<sup>1</sup> group; P<sup>1</sup> is hydrogen or a protecting group;

R<sup>2</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl substituted by -COOP<sup>2</sup>, -NHP<sup>2</sup>, -OP<sup>2</sup> or -SP<sup>2</sup>, wherein P<sup>2</sup> is hydrogen or a protecting group;

M is a naturally or non-naturally occurring heterocyclic moiety bound to N by a one to three carbon linker; and

10 R<sup>3</sup> is a sterically bulky substituent containing 3 or more non-hydrogen atoms.

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F3  
F0

Add  
H'